

Lab Program 1

Develop a Java program that prints all real solutions of quadratic equation $ax^2+bx+c = 0$. Read in a, b, c and use the quadratic formula. If the discriminant b^2-4ac is negative, display a message stating that there are no real solutions.

```
import java.util.*;
import java.util.Scanner;
class quadeqn
{
    public static void main(String ss[])
    {
        double d;
        int a,b,c;
        Scanner s = new Scanner(System.in);
        System.out.println("Enter the values of a, b and c");
        a=s.nextInt();
        b=s.nextInt();
        c=s.nextInt();
        d= (b*b)-(4*a*c);
        if (a==0)
        {
            System.out.println("Invalid input");
        }
        else if(d>0)
        {
            double r1=(-b+Math.pow(d,0.5))/(2*a);
            double r2=(-b-Math.pow(d,0.5))/(2*a);
            System.out.println("Roots are real and distinct");
            System.out.println("r1 = "+r1 + " " + "r2= "+r2);

        }
        else if(d==0.0)
        {
            double r1 = -b/(2*a);
            System.out.println("Roots are real and equal");
            System.out.println("r1 = r2 = "+r1);
        }
        else if(d<0)
        {
            System.out.println("Roots are imaginary ");
        }
    }
}
```

```

        double real = -b/2*a;
        double img = (Math.sqrt(Math.abs(d)))/(2*a);
        System.out.println("r1= " +real+"i"+img);
        System.out.println("r2= " +real+"i"+img);
    }
}
}

```

```

C:\Users\DELL\OneDrive\Desktop\1BM21CS050> javac quadeqn.java

C:\Users\DELL\OneDrive\Desktop\1BM21CS050> java quadeqn.java
Enter the values of a, b and c
0 4 5
Invalid input

C:\Users\DELL\OneDrive\Desktop\1BM21CS050> java quadeqn.java
Enter the values of a, b and c
1 4 3
Roots are real and distinct
r1 = -1.0 r2= -3.0

C:\Users\DELL\OneDrive\Desktop\1BM21CS050> java quadeqn.java
Enter the values of a, b and c
50 100 50
Roots are real and equal
r1 = r2 = -1.0

C:\Users\DELL\OneDrive\Desktop\1BM21CS050> java quadeqn.java
Enter the values of a, b and c
1 2 3
Roots are imaginary
r1= -1.0+i1.4142135623730951
r2= -1.0+i1.4142135623730951

C:\Users\DELL\OneDrive\Desktop\1BM21CS050>

```

(Saathi)

Date: 18/11/22

Program 1

Develop a JAVA program to find all real solutions of quad. equations $ax^2+bx+c=0$.

```

import java.util.*;
import java.util.Scanner;
public class quadEqn {
    public static void main(String ss[]) {
        Scanner s = new Scanner(System.in);
        System.out.println("Enter the values of a, b and c");
        int a = s.nextInt();
        int b = s.nextInt();
        int c = s.nextInt();
        double d = (b*b) - (4*a*c);
        if (d > 0) {
            double x1 = (-b + Math.pow(d, 0.5)) / (2*a);
            double x2 = (-b - Math.pow(d, 0.5)) / (2*a);
            System.out.println("Roots are real and distinct. x1 = " + x1 + " x2 = " + x2);
        }
        else if (d == 0.0) {
            double x1 = -b / (2*a);
            System.out.println("Roots are real and equal. x1 = x2 = " + x1);
        }
        else {
            System.out.println("Roots are not real");
            double d_sqrt = Math.sqrt(Math.abs(d) / (2*a));
            double ang = Math.atan(d_sqrt / (-b / (2*a)));
            System.out.println("x1 = " + x1 + "i + t*ang);
            System.out.println("x2 = " + x1 + "i + t*ang);
        }
    }
}

```

(Saathi)

Date: / /

Enter the values of a, b and c
0 4 5
Invalid input

Enter the values of a, b and c
1 4 3
Roots are real and distinct
x1 = -1.0 x2 = -3.0

Enter the values of a, b and c
50 100 50
Roots are real and equal
x1 = x2 = -1.0

Enter the values of a, b and c
1 3 3
Roots are imaginary
x1 = -1.0 + 1.4142i x2 = -1.0 + 1.4142i

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